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prefix delta encoding overlapping characters with previous entry; and

providing a rule set for converting text to phones according to said rule set for text not in the dictionary and fit the rule set.

11. (amended) The method of claim 10 including the step of: providing error encoding of the difference from the rule set for those pronunciations of text not in the alphabetized text and not fitting the rule set.

Cancel Claim 14 without prejudice.

REMARKS

The applicant has amended claim 1 and 10 to include the limitation of the dictionary to include a rule set which is part of the limitation in claims 2 and 11. Since this limitation is already in the claims no new search is needed and the same issues remain. Therefore applicant respectfully requests that these amendments be enter at least for purposes of appeal to limit the issues under appeal.

The changes made are identified in the Appendix provided wherein the added material is represent by underlining and the removed material in brackets [].

The background of the invention of the specification describes what a text-to-phone dictionary is as compared to building speech recognition models. In building recognition models the first step is to go to the pronunciation dictionary and start with the text and look up a pronunciation dictionary of the phones for the text. Once the phones are identified and the sequence of phones for the words is determined, HMM model for each phone is determined.

The present invention relates to the pronunciation dictionary. One must have the memory space to do the lookup. In accordance with the present invention this memory space is reduced by the dictionary containing alphabetized text and corresponding phones; having overlapping

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characters with previous entry that are prefix delta encoded; and by a rule set to convert text to phones for text not in the dictionary. This combination reduces the memory space to do the lookup.

In the examiner's response to arguments the examiner states that the applicant's arguments fail to comply with 37 C.F.R. 1.11 (b) because they amount to a general allegation that the claims define patentable invention without specifically pointing out how the language of the claims patentably distinguishes them from the references. Applicant disagrees with this statement. Applicant stated that the Claim 1 calls for "a pronunciation dictionary comprising: an alphabetized text and corresponding phones and the overlapping characters with previous entry are prefix delta encoded." A dictionary by definition is a list of words and as claimed is an alphabetized text and corresponding phones. Applicant further calls for this dictionary of to have overlapping characters with previous entry to be prefix delta encoded. For example, the entry "abandoned" is followed by "abandoning", then "abandoning" is encoded as "-7ing". In this case it means using the first seven of the nearest neighbor and adding "ing". As also further pointed out that the applicant's invention provides a resource efficient representation of a pronunciation dictionary by efficiently formatting the pronunciation dictionary. The above example reduces 10 bytes to four bytes. Again, the object is to compress the size of the pronunciation dictionary while maintaining the searchability. Applicant further argued why the Kanevsky patent reference does not teach this. Applicant stated that the Kanevsky patent is on language modeling for inflected language. It further stated that language modeling is statistical. It describes grammar in a probabilistic fashion. The dictionary claimed by applicant is not based on probability at all. For each word in the dictionary there is one and only one sequence of phones to describe the pronunciation. The examiner has further argued that there is no need for a single

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pronunciation of a word because of the teachings of Kanevsky allows for choosing one pronunciation from several to compensate for varying dialects. This statement suggests models and not a pronunciation dictionary as discussed above.

Further, there is nothing in Kanevsky to suggest the combination of the alphabetized text and corresponding phones, overlapping characters with previous entry that are prefix delta encoded and a rule set to convert text to phones for text for text not in the dictionary and fit the rule set. This further reduces the size of the dictionary by the rule set. Nothing in Kanevsky teaches or suggests a rule set and further that the rule set be used to convert text to phones for text not in the dictionary and fit the rule set. Applicant's invention takes advantage of a "text to phone rule set" to predict the pronunciation "before" it is encoded in the pronunciation in the dictionary. This combination is not taught or suggested by Kanevsky.

Kuhn et al. (U. S. Patent no. 6,230,131; hereinafter Kuhn) discloses a method for generating spelling to pronunciation in which decision trees are used to store a series of yes-no questions that can be used to connect spelled word letter sequences into pronunciations. Kuhn teaches a method of using decision tree questions to generate phones from spelling. This method requires "letter only trees" and "mixed trees" which require a lot of memory to store. This is to deal with pronunciation that is not in the dictionary. The prior art attempted to improve the rule set so that the pronunciation would be as close as possible to a dictionary. Sometimes the rule set ended up larger than a dictionary, which defeats the purpose of a rule set. Applicant wants to generate "dictionary accurate pronunciation" using a much smaller memory than required by a dictionary. For those words not found in the dictionary, it will be handled by the rule set. It is not seen where Kuhn in any way suggests this. Nothing in Kanevsky or Kuhn suggests a pronunciation dictionary that comprises the combination of a rule set and an alphabetized text

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and corresponding phones and the overlapping characters with previous entry are prefix delta encoded.

In view of the above applicant's claim 1 is deemed allowable over the references.

Applicant's Claim 10 calls for: "A method of making a pronunciation dictionary comprising the steps of: alphabetizing text and corresponding phones; prefix delta encoding overlapping characters with previous entry; and providing a rule set for converting text to phones according to said rule set for text not in the dictionary and fit the rule set."

Since claim 10, as amended, calls for the pronunciation dictionary to include the alphabetizing text and phones, the prefix delta encoding and the rule set. Claim 10 is therefore allowable for at least the same reasons as Claim 1.

Claim 2 calls for an error encoded set for those entries different from the rule set wherein the entry only contains the difference with the rule set predictions. The examiner references U.S. Patent No. 6,148, 283 (hereinafter Das). Das teaches a multi-stage VQ, which is applied on numerical data. The examiner uses it to show the idea of error encoding. The Das reference does not teach error encoding on text encoding, not to mention pronunciation encoding. It is not seen where any combination of the Kanevsky, Kuhn and Das references teaches the combination.

In view of the above applicant's claim 2, as amended, is deemed allowable over the references. Claim 11 includes similar limitations and is deemed allowable for at least the same reasons. Claim 12 and 13 dependent on Claim 11 are deemed allowable for at least the same reasons as Claim 11.

Applicant's claims 3 and 4 dependent on Claim 2 are deemed allowable for at least the same reasons as Claim 2.

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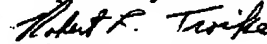
Claim 5 calls for the dictionary to comprise the rule set and the error encoding set. It is not seen where this is taught in the Kuhn and Das references for the reasons urged above in connection with claims 1 and 2. Claims 6 dependent on Claim 5 is deemed allowable for at least the same reasons as Claim 5 and further for calling for the error encoded set to be prefix delta encoded. Claim 7 dependent on Claim 6 is deemed allowable for at least the same reasons as Claim 6. Claim 8 dependent on Claim 5 is deemed allowable for at least the same reasons as Claim 5 and further for reasons discussed in connection with Claim 1.

Claim 9 calls for a pronunciation dictionary as claimed in Claim 2 and is therefore deemed allowable for at least the same reasons as Claim 2.

In view of the above applicant's Claims 1-13, as amended herein, are deemed allowable and an early notice of allowance of these claims is deemed in order and is respectfully requested.

If the examiner persists in the rejection of the Claims 1-13 applicant respectfully requests that this amendment be entered for purposes of appeal.

Respectfully submitted,



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APPENDIX

1. (amended) A pronunciation dictionary comprising:

alphabetized text and corresponding phones; [and]

overlapping characters with previous entry that are prefix delta encoded; and

a rule set to convert text to phones for text in the dictionary.

2. (amended) The pronunciation dictionary of claim 1, including [a rule set to convert text to phones for text not in the dictionary; and] an error encoded set for those entries different from the rule set wherein the entry only contains the difference with the rule set predictions:

10 (amended) A method of making a pronunciation dictionary comprising the steps of;

alphabetizing text and corresponding phones; [and]

prefix delta encoding overlapping characters with previous entry; and

providing a rule set for converting text to phones according to said rule set for text not in the dictionary and fit the rule set.

11. (amended) The method of claim 10 including the step[s] of: [converting text to phones according said rule set for text not in the dictionary and fit the rule set; and] providing error encoding of the difference from the rule set for those pronunciations of text not in the alphabetized text and not fitting the rule set.

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In re the Application of

Applicant Yu-Hung Kao

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Serial No.: 09/590,613

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Filed: 06/08/00

Examiner: Angela A. Armstrong

For: Method of Generating a Compact Test-to-Phone Dictionary

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